California Regional Water Quality Control Board
San Diego Region

Winston H. Hickox
Secretary for Environmental Protection

Internet Address: http://www.swrcb.ca.gov/rwqcb9/
9771 Clairemont Mesa Boulevard, Suite A, San Diego, California 92124-1324
Phone (858) 467-2952 • FAX (858) 571-6972

Gray Davis
Governor

- - CERTIFIED MAIL – RETURN RECEIPT REQUESTED - -
Z 068 636 685

February 9, 2001 **FILE NO: 06-0024**

Mr. Richard Chase
Gregory Canyon Ltd.
c/o Taconic Resources
212 North Cedros Avenue
Solana Beach, California 92075

Dear Mr. Chase:

RE: JOINT TECHNICAL DOCUMENT FOR GREGORY CANYON LANDFILL DATED JANUARY 2001

The purpose of this letter is to acknowledge receipt of the Joint Technical Document (JTD) by the California Regional Water Quality Control Board, San Diego Region ("Regional Board") on January 11, 2001. The current JTD supersedes the previous document submitted to the Regional Board on December 22, 1999. We understand that this JTD includes responses to comments in our letter dated December 8, 2000. We have reviewed the current JTD to determine whether or not our previous concerns have been adequately addressed. In addition, our review included the use of the State Water Resources Control Board (SWRCB) JTD Index to determine whether or not the document includes complete information required by Title 27, California Code of Regulations ("27 CCR"). Based upon our review the Regional Board has determined the current **JTD is incomplete**.

General Comments

1. **Pursuant to 27 CCR §21750** the JTD must contain all the information that would normally be required to be submitted to the Regional Board in a Report of Waste Discharge (ROWD). The Regional Board has identified areas of specific deficiencies in the comments provided below.

2. **Pursuant to 27 CCR §21585(4)(b)** the discharger is required to *"… list all JTD pages (by page number of ranges thereof)"* addressing SWRCB portions of 27 CCR. During our review, we determined that many citations listed in the JTD Index were incorrect. In some instances, the referenced pages did not respond to the cited section of 27 CCR or the page ranges referred to an entire Appendix when only a few pages of the Appendix actually addressed the cited section of 27 CCR. Since the Regional Board has only 30 days to determine whether or not the JTD is complete, it is imperative that the JTD Index

contains accurate and specific information. Please note that our review was largely based on the pages cited in the JTD Index. If the referenced pages did not contain the required information, we have determined that the JTD is deficient for that particular section of the regulations.

Specific Comments

Below are our comments on information contained in the SWRCB JTD Index. For ease of your review, our comments are in the same order as in the JTD Index.

1. **27 CCR §20080 (b – c) General Requirements [engineered alternatives to prescriptive standards**

Based upon our understanding of the JTD, the Regional Board concludes that the proposed engineered alternative does not comply with the minimum prescriptive standards identified in 27 CCR §20240 (c). The JTD does not contain adequate information to make the required demonstrations to the Regional Board [as required by 27 CCR §20080(b) and (c)] in support of the proposed engineered alternative. It is not clear that the engineered alternative would effectively meet the performance standards specified in 27 CCR §20310(c) for Class III landfills.

The discussion of the slope stability analysis suggests the prescriptive standards would not meet the minimum factor of safety as required under 27 CCR. However, the JTD should be revised to include a prescriptive standard landfill with modifications made to achieve the required factor of safety.

Do the locations of cross-sections x-x' and y-y' on Figure 2 of Appendix Q represent the most critical cross-section alignments for purposes of landfill stability analyses? Figure 2 of Appendix Q shows the engineered alternative and prescriptive standard landfills in profile sections used for the slope stability analysis. It appears that the prescriptive standard could be modified to include design elements, e.g. a toe berm or flattening the base grade of slopes, which could provide additional stability. The Regional Board concludes the JTD contains inadequate evidence that a modified prescriptive standard design could not reasonably be used at the site. We recommend the discharger redesign the prescriptive standard landfill incorporating additional design elements(s) for added stability and perform new slope stability analyses.

The engineered alternative does not include a maintenance plan for the subdrain. This raises a number of unanswered concerns for the Regional Board, including:

a. How will the subdrain system be adequately maintained?

b. How can the Regional Board be assured that the minimum five feet of separation between the highest anticipated groundwater will be maintained?

c. What happens to the water discharged from the subdrain system during the post-closure period of the landfill when the need for dust control disappears?

The JTD states that the subdrain is incorporated into both the engineered alternative and the prescriptive standard designs. What is the purpose of retaining a subdrain system for a landfill designed to contain wastes at a minimum separation distance of 5 feet above historic high levels of groundwater? The prescriptive standards for Class III landfills would locate the waste containment unit **at least 5 feet** above the highest anticipated groundwater elevation at the site.

The fiscal analysis in the JTD does not appear to consider all reasonably foreseeable costs associated with the implementation of the engineered alternative *vs.* the prescriptive standards. Some of the omissions from the fiscal analysis for the engineered alternative include:

a. Regular monitoring of and evaluation of subdrain performance;

b. Regular maintenance of the subdrain system;

c. Implementation of a contingency plan against failure of the subdrain resulting from clogging (e.g., by sediment and/or biofouling); and

d. Repairs to be made to the subdrain system in the event of reduced or inadequate performance.

2. **27 CCR §20200(a) Concept**

Page B. 2-3, B.2.2.2 California Regional Water Quality Control Board

The last paragraph of this section indicates that the discharger would apply for the *General NPDES permit for Authorization for Discharges of Groundwater to Surface Waters* ***if needed***. It would be prudent for the discharger to apply for this permit at least 60 days prior to the construction of the landfill in case it is determined to be needed, rather than wait until the last minute. Otherwise, a discharge of waste constituents to groundwater will need to be effectively contained onsite. This would have the effect of precluding the discharge of treated groundwater to surface waters as a short-term mitigation alternative. Also note that Order No. 96-41 is due to expire on June 13, 2001.

3. **27 CCR §20220(c) – (c)(3) Dewatered Sludge**

Page B.1-5 indicates that dewatered sludge will be received at the proposed Gregory Canyon Landfill. A demonstration of compliance with discharge requirements in 27 CCR must be submitted as part of a complete JTD.

4. **27 CCR §20240 Classification and Siting Criteria**

The following items for this section of 27 CCR were missing:

a. Chemical properties of geologic materials.

b. In-place hydraulic conductivity of soils immediately underlying the unit and a map showing the location of in-place hydraulic conductivity tests.

c. A map showing location of all springs within the waste management facility and within one mile of its perimeter.

d. An evaluation of the perennial direction(s) of groundwater movement within the uppermost groundwater zone(s) within one mile of the waste management facility's perimeter.

27 CCR §20240(c) requires that all new landfills be sited, designed, constructed, and operated to ensure that wastes will be a *"minimum of five feet above the highest anticipated elevation of underlying groundwater."* The prescriptive standards of 27 CCR are minimum standards. The Regional Board may impose more stringent requirements to accommodate regional and site-specific conditions. The Regional Board may consider engineered alternatives; however, alternatives may be approved only where the discharger demonstrates that the standard is not feasible and the alternative affords equivalent protection against water quality impairment.

The engineered alternative proposes to excavate in order to construct a large area of the waste management unit beneath the current, natural piezometric surface (or presumed water table). Alternatively, if the landfill is constructed without excavating below the water table the landfill area could be designed to meet or exceed the minimum five-foot separation from groundwater. Most of the landfill could be much greater than five feet from groundwater, thereby affording greater protection against water quality impairment.

The JTD proposes an engineered alternative that includes constructing the waste containment unit to a depth of 160 feet below the current groundwater elevation. The assertion in the JTD is that a separation distance of five-feet is maintained by installing a

subdrain system to capture and convey groundwater entering the excavation. The engineered alternative may not afford equivalent protection against water quality impairment for reasons including the following:

- It may reasonably be expected that subdrain systems will have problems with clogging, due to sediments or biofouling, or both. It could be extremely difficult or impossible effectively monitor the condition of the subdrain system, identify any problem areas, and perform any required repairs or maintenance once a liner and landfill materials are employed over the subdrain.

- The subdrain system would be in direct contact with the saturated zone located beneath the water table. As such, it has the potential to rapidly transport any groundwater pollutants released laterally and vertically. A release to the unsaturated zone would have to travel downward over a distance generally greater than five feet before entering groundwater. A sufficiently thick section of the unsaturated zone can often provide an effective buffer to retard the spread of soluble environmental pollutants.

5. **27 CCR §20260 Class III: Landfills for Nonhazardous Solid Waste**

The following items were missing for this section of 27 CCR:

a. Hydraulic conductivity and transmissivity of the underlying soils.

b. Depth to groundwater and variations in depth to groundwater.

Section C.2.2.4 Stockpile/Borrow Areas

The JTD does not describe measures that will be taken to ensure the stability of slopes created in the Stockpile/Borrow Areas (A and B) during the life of the project. The JTD proposes to stockpile/extract significant volumes of soil from these areas of the site. Slope failures due to the creation of overly steep slopes, over loading of slopes, and/or seismic events could adversely impact the discharge of sediments into stormwater conveyance system/surface waters and/or create geological hazards at the site. The JTD should include a description of mitigation measures that will be used to insure the stability of slopes created by landfill operations in Stockpile/Borrow Areas A and B.

6. **27 CCR §20330 SWRCB Liners**

Until such time as the final cover is installed on the landfill, the liner system must provide effective waste containment and meet the performance standards required 27 CCR, §20310(c): *"… waste containment structures capable of preventing degradation of*

waters of the state as a result of waste discharges to landfills…." The JTD does not provide adequate information for the Regional Board to make a finding that the proposed liner design (i.e., single composite liner) for the engineered alternative will effectively meet the required performance standard for the operational life of the waste management unit.

Section C.1.1 (Alternative Liner System Design).

The JTD states: *"Although it is not anticipated at this time, GCL may develop an alternative liner design for the GCLF in the future. A formal petition for any proposed alternative liner design will be submitted to the RWQCB for review and approval prior to installation."* Our evaluation of the landfill design must be based upon a thorough knowledge of all the final design elements for the facility. Re-evaluating an alternative liner design, after the issuance of waste discharge requirements, **will require the Regional Board to re-consider the viability of the entire project**.

7. **27 CCR §20323 and §20324 CQA Plan & Requirements**

The following items were missing for these sections of 27 CCR:

a. A detailed description of training and experience for work crew

b. A detailed description of training and experience for the contractor, work crew, and CQA inspectors (Appendix O).

c. A description of minimum testing for field density.

d. Field hydraulic conductivity testing for the barrier layer.

8. **27 CCR §20340 Leachate Collection and Removal Systems**

According to the model used in the JTD, the peak leachate generation rate will be approximately 9,250 gallons/day. It seems unlikely that the proposed two 10,000 gallon storage tanks would be sufficient to contain leachate, particularly during the rainy season.

Appendix D

a. Please provide the rationale for selecting a 20-year post-closure period for the leachate analysis *vs*. a 30-year post-closure period as defined in 27 CCR §21769(b)(1).

b. Figure 1. The graph for Precipitation does not plot all of the data from the HELP 3 model. Please provide a complete graph of annual precipitation *vs.* time.

9. **27 CCR §20390 Water Quality Protection Standard**

Constituents of Concern and Concentration Limits will be determined after background water quality has been established.

10. **27 CCR §20405 Monitoring Points and the Point of Compliance**

Section B.5.1.3.1 Groundwater Monitoring Well Locations

The JTD suggests using wells 2 (Lucio Dairy) and well 34 belonging to the San Luis Rey Municipal Water District (SLRMWD) as upgradient groundwater monitoring wells. The revised JTD must include well construction details, current well uses, and a detailed location map (including site topography) before the Regional Board can evaluate the adequacy of these wells for inclusion in the groundwater monitoring program.

The text should be revised to explicitly identify the *"seven Phase 1 wells and three wells within the San Luis Rey River Valley"* that are to be sampled on a quarterly basis for one year prior to the discharge of wastes at the site. This could be efficiently done using a location map and a table identifying the well name and well construction details (e.g., well head elevation, depth to screen, length of screened interval, etc.) and depth to groundwater observed in the selected wells.

The JTD should provide an evaluation of permanent well locations, including cluster well configurations, for monitoring background water quality outside the footprint of the landfill at the beginning of the project. This may allow background groundwater monitoring to continue from the same locations throughout the life of the landfill. This may be preferable to the periodic movement of background monitoring points as the facility fills with waste.

Appendix E

Monitoring points described on page 15 of Appendix E are not adequate for the detection monitoring program. Proposed monitoring points GLA-2 and GLA-9 were described on page 12 as *"low yield"* wells. These wells are not appropriate for inclusion into the detection monitoring well network. GLA-9 was indicated as a *"dry well"* on Figure 4. Therefore, a proposal for new monitoring well locations will need to be provided in the revised JTD. New monitoring well locations need to be proposed and located where the fractured aquifer results in at least "average-yield" monitoring wells. This requirement must also be met for the additional background monitoring well on the east side of the

landfill and the two downgradient monitoring wells. The groundwater monitoring well network will need to be specifically described in the final waste discharge requirements for the proposed Gregory Canyon Landfill.

11. **27 CCR §20410 Compliance Period**

Not addressed in the JTD.

12. **27 CCR §20415 (b) – (b)(4)(D) Groundwater Monitoring System (general)**

Monitoring well performance standards were not addressed in the JTD.

The JTD needs to provide better supporting data to substantiate the stated assumption of an equivalent porous medium for the bedrock aquifer at the site.

The "Subdrain-Gravel Drains" section of the report contains descriptions of *"major seeping fractures"* which apparently control the *"majority of the seepage flow"* at the site. Discrete high permeability zones limit or invalidate the use of the equivalent porous medium assumption. Knowledge of locations of all zones of high permeability zones, which can become preferential pathways for contaminant transport, is critical when laying out an effective groundwater monitoring well network.

13. **27 CCR §20415(c) – (c)(2)(D) Surface Water Monitoring (general)**

Section B.5.1.3.2 Surface Water Monitoring

Ambient water quality from the third monitoring point (located downstream from Hanson sand and gravel: Background 2) and the fourth recommended monitoring point (located east of access road bridge: Compliance 2) need to be thoroughly evaluated to determine the adequacy of these locations to provide representative surface water monitoring points. To assess the natural variability in surface water quality, the proponents should institute a monitoring program for surface water quality prior to initiating the discharge of wastes at the Gregory Canyon Landfill.

The discharger should collect surface water samples from the locations recommended in the JTD. During the period preceding the discharge of wastes at the landfill, at least two surface water samples should be collected and analyzed annually during the wet season (November to April) from each of the monitoring locations. The results from this monitoring effort will be used by the RWQCB to develop and support water quality protection standards (per 27 CCR §20390) for waste discharge requirements.

Figure 10

Please ensure that each sampling point, e.g. Compliance 1, is labeled.

14. **27 CCR §20415(e)(5) Sampling & Analytical Methods**

Sampling and Analysis Plan, Appendix E

a. Page 11, 8.0 Leachate Sampling Procedures. The wording between the second and third paragraphs, regarding field-filtered samples, is inconsistent. Please review and revise these paragraphs for consistency.

b. This section should be revised to include sampling for compliance with construction/industrial storm water NPDES permits.

15. **27 CCR §21090(a)(2) – (a)(4)(D) Maintenance**

a. The Post-Closure Maintenance Plan does not contain a plan for protecting the low-hydraulic-conductivity layer from foreseeable sources of damage that could impair its ability to prevent throughflow of water (e.g., desiccation, burrowing rodents, or heavy equipment damage).

b. The Post-Closure Maintenance Plan does not contain a schedule for carrying out periodic maintenance of vegetative cover to ensure the integrity of the low-hydraulic conductivity layer.

16. **27 CCR §21090(c) – (c)(5) General Post-Closure Duties**

The Post-Closure Maintenance Plan needs to contain a provision for the continuation of operation of the leachate collection and removal system as long as leachate is generated and detected at the site.

17. **27 CCR §21090(e) – (e)(4) Final Cover Survey(s)**

The Post-Closure Maintenance Plan needs to ensure that differential settlement of the landfill is tracked in accordance 27 CCR, §21090(e)(4).

18. **27 CCR §21585 SWRCB JTD Format**

The JTD index prepared for this submittal is inaccurate. Please review the page numbers to ensure that the citation matches the SWRCB requirements. Several page citations were incorrect. Other citations were too general, e.g. referral to an entire Appendix when the

actual information is contained on specific pages. In addition, please include page numbers in the Table of Contents for the tables inserted throughout the text. See General Comment No. 2 above.

19. **27 CCR §21750(a) Analysis of potential for impairment**

The JTD did not contain analyses of potential impairment of beneficial uses of groundwater or surface water resources.

Section C.3.7 and Appendix M (Soil Loss Analysis)

The soil loss presented for the Gregory Canyon Landfill is estimated at 363 tons per year (or 267 cubic yards per year). It is not clearly stated how this soil will be discharged from the site. Presumably the discharge would take place through the storm water conveyance system and contribute to the sediment load already present in the San Luis Rey River.

The soil loss analysis should be revised to include an estimate of soil loss occurring under ambient conditions at Gregory Canyon. This would allow for a comparison between the estimated sediment erosion rate under pre- and post-development conditions. These results should be used to assess whether the project will increase or decrease sediment discharges from the project area into the San Luis Rey River. The estimated discharge of sediment should be one component in the analyses of potential impairment of beneficial uses of water resources.

20. **27 CCR §21750(d)(1) Topographic Map**

Figure 2 does not include the entire area within one mile from the perimeter of the unit.

21. **27 CCR §21750(d)(2) – (d)(2)(C)(2) Floodplain Analysis**

The JTD does not include the source of data for the determination that the proposed Gregory Canyon Landfill in not located within the 100-yr floodplain.

22. **27 CCR §21750(e) – (e)(6) Climate**

The JTD is missing the following information required by 27 CCR:

a. isohyetal map;

b. minimum annual precipitation; and

c. evapotranspiration data for the proposed Gregory Canyon Landfill.

23. **27 CCR §21750(f)(2) Materials**

Section D.4.2

The description of *"site geology"* should be revised to include a discussion of susceptibility of lithologic units to effects from natural surface/near surface processes.

24. **27 CCR §21750(f)(3) Geologic Structure**

The JTD did not include an adequate discussion of the natural geologic structure underlying the waste management unit and its surroundings. The discussion should be revised to include information on the nature and type of folding (if present), and the orientation of strata and features within the metamorphic bedrock unit (TJm).

25. **27 CCR §21750(f)(4) Engineering and Chemical Properties**

The JTD did not include an adequate discussion of the engineering and chemical properties of geologic materials underlying the waste management unit and its surroundings. The tabulated data (JTD Tables 10, 11 and 12) need to be augmented by a location map and cross-section(s) indicating the sample locations. It is not clear if the sample results (as presented in the referenced data tables) are "representative" of the geologic materials that will remain in-situ beneath the proposed waste containment unit.

The Regional Board has some concerns with the engineering data as reported and tabulated on page 15 of the Phase 6 Geotechnical Investigation (Appendix G). The data for cohesion (pounds per square ft or psf) and friction angle (degrees) were apparently used by GeoLogic for stability calculations. Our questions regarding the data presented for cohesion/friction angles (e.g., indicated as *"900 / 31"* below) of the tabulated materials are as follows:

Refuse 900 / 31 - These numbers may be high. Should these numbers be closer to 500 / 0 for effective stresses up to 770 psf and 0 / 33 for stresses above 770 psf (using Ed Kavazanjians's bi-linear failure envelope approach)?

Sand/geotextile 230 / 37 – These numbers may be high. Sand typically has no cohesion. The friction angle may be high, unless the sand is angular in shape. Were these data based upon results from testing? The JTD should indicate how were these data were derived.

Geotextile/textured HDPE (floor and slopes) 0.0 / 14 - Twelve (12) degrees would be a conservative number, unless supporting data (based upon test results) are provided in the JTD.

Textured HDPE/clay 430 / 22 – These data appear to be high. Are they post peak/residual values?

Clay 1000 / 15 - Are these data based upon the results from testing or are the data taken from a technical reference?

Clay/geotextile 0.0 / 24 – The JTD should provide an explanation for why the data exceed the number for textured HDPE (lower at 22 above).

Geotextile/drainage gravel 230 / 7- These numbers appear to the same as those reported for sand (see above). One could expect the strength of "sand" to be less than that of "gravel." Please provide supporting results from testing within the JTD and a written discussion as necessary.

The JTD did not include a discussion of the chemical properties of geological materials underlying and surrounding the proposed unit.

26. **27 CCR §21750(f)(5) Stability Analysis**

Appendix G

Figure 15, *Configuration of the 3-dimensional scenario with a large buttress,* provides only a plan view of the failure surface. The revised JTD should also include a profile view of the same configuration.

Appendix N

Page 13, Kinematic Analysis, assumes a "conservative 34^{o} angle of internal friction." Provide additional information that this assumption truly conservative with respect to the description of moderately to intensely *"weathered tonalite"* occupying the western and central portions of the area (see page 4) and which reportedly may "disaggregate easily under pressure"?

28. **27 CCR §21750(f)(7) Fault Identification and Proximity**

The text discussion of "Seismicity" of the JTD should be revised to include an estimation of the cumulative duration of strong motion from aftershocks from design earthquakes.

The revised analysis should include an evaluation of field evidence for the continuation of the feature labeled "WWC 1995" (JTD Appendix N: Figure 3) south to the vicinity of Gregory Canyon. If field evidence is found to support the southern continuation of the

"WWC 1995 fault", an analysis of potential seismicity/characteristics [per 27 CCR, §21750(f)(7)] of that feature should be included in the revised JTD.

28. **27 CCR §21750(g) - (g)(7)(D) Hydrogeology**

The JTD does not provide the necessary information concerning hydrogeology within one-mile of the waste management facility's perimeter. For example, very little information is provided on the surface water and groundwater within Couser Canyon, south of the site. The USGS Pala 15-minute quadrangle map shows a stream in Couser Canyon that is less than a few hundred feet from the proposed limit of landfill grading. The JTD does not discuss how any on-site dewatering activities at the facility will impact domestic wells, other wells (e.g., agricultural or municipal), springs, or surface waters within one-mile of the facility's perimeter.

The JTD did not include an evaluation of water quality (for surface water and groundwater) known to exist within one mile of the waste management facility's perimeter. This information is needed to establish water quality protection standards for water resources (per 27 CCR, §20390). If this information is presented in other sections of the JTD, the revised description should include specific citations in the text where the information can be found.

The fracture orientation information provided in the JTD does not communicate essential information on fracture density and distribution in the subsurface. This information is necessary in order to assess the assertion made in the JTD that the bedrock functions as an *"equivalent porous medium."*

29. **27 CCR §21750(h) – (h)(5) Land/Water Use**

The JTD does not include an acceptable map clearly illustrating the locations of all water wells within one mile outside the facility boundary. The revised JTD should identify any existing water wells located within one mile of the facility boundary. For each well identified, provide a text description or a tabulation of the name and address of each owner, and the additional well information required in 27 CCR §21750(h)(3).

The revised JTD should provide an assessment of current and estimated future uses of groundwater within one mile of the facility perimeter. Useful sources of information on this topic may include the San Diego County Water Authority and the local water district(s).

Appendix N, Figure 1 and Figure 20 show 5 wells in Couser Canyon, two indicated as "domestic", two indicated as "not in use" and one indicated as "unknown". Additional information is needed for these and all other wells located within one mile of the facility

boundary. The JTD does not discuss how proposed on-site dewatering activities will impact these wells, or other wells, springs, or surface water within one mile of the facility boundary.

The Land Use information is also deficient. Additional information needs to include:

a. types of crops;

b. types of livestock and the number of animals; and

c. location of dwelling units within one mile of the perimeter of the unit.

30. **27 CCR §21760(a)(3) – (a)(4) Design Report**

The JTD does not contain the information required by 27 CCR §21760(a)(3)(B).

31. **27 CCR §21760(b) – (b)(3) Operation Plan**

The JTD does not contain a contingency plan [as required by 27 CCR §21760(b)(2)] for the failure or breakdown of waste handling facilities or containment systems. The Emergency Response Plan provided in the JTD only covers the post-closure maintenance period.

32. **27 CCR §22222 Financial Assurance Requirements for Corrective Action**

Section B.5.1.6 Anticipated Methods of Mitigation: Surface Water

The proposed Gregory Canyon Landfill is located in proximity to sensitive beneficial uses of surface water occurring in the San Luis Rey River. However, this section of the JTD does not identify any mitigation methods that would be taken in the event that solid wastes and/or waste constituents make their way into surface water resources. The discussion revised JTD must be augmented to include mitigation measures to be implemented in the event of a release to surface waters. The discussion should include a description of mitigation measures for "reasonably foreseeable release" of solid wastes/dissolved waste constituents from the waste containment unit. The revised JTD should include analysis of mitigation measures for a reasonably foreseeable release, or the largest release the unit could have before it would be detected, for groundwater and surface water resources. The discussion of anticipated mitigation measures is incomplete as currently presented in the JTD.

Section B.5.1.6 Anticipated Methods of Mitigation: Groundwater

It is not clear that a reverse osmosis (RO) treatment system could be modified to effectively treat volatile organic constituents (VOCs), as suggested in the text. The discharger should provide reference information regarding the field implementation of modified RO systems to effectively treat a range of VOCs [including chlorinated VOCs, fuel constituents and fuel additives] to applicable water quality objectives. The discussion in Section B.5.1.8 should be augmented to describe how this could be accomplished with the RO system designed for this site.

Section B.5.1.7 Estimated Cost for Reasonably Foreseeable Release Mitigation: Surface Water

The discussion should be augmented to include estimated costs to mitigate releases to surface water (also see comment above). At a minimum, this evaluation should include the same factors that are described in our comment below on the *"Estimated Cost for Reasonably Foreseeable Release Mitigation: Groundwater."*

Section B.5.1.7 Estimated Cost for Reasonably Foreseeable Release Mitigation: Groundwater

The JTD does not describe the underlying assumptions used in the evaluation of costs. At a minimum, a clear description of these assumptions must include the following information for the foreseeable release to water resources being evaluated in the JTD:

a. the magnitude of the release (e.g., geographic area and depth),

b. the types and concentrations of waste constituents/pollutants released,

c. the media impacted by the release (e.g. soil, sediments, groundwater, surface water),

d. the methods necessary to delineate the release,

e. the evaluation of corrective action alternatives, and

f. methods of remediating the release of waste constituents/pollutants to the various media. (the horizontal and vertical extent and nature of waste constituents/pollutants within of the release).

An explanation of the factors listed above is necessary for the Regional Board to complete our evaluation of costs for mitigation alternatives presented in the JTD.

Table 8: Estimated Mitigation costs

There should be a cost for water treatment included in Table 8. Presumably, the RO system would initially be designed to treat water for inorganic constituents (e.g., total dissolve solids or TDS). It is not clear that the proposed RO system could be modified to effectively treat volatile organic constituents (or VOCs) in groundwater to the required water quality objectives. If such a modification is possible, presumably there would be a cost associated with the design, implementation, and testing of the modified RO system. It has been the experience of the Regional Board that other treatment systems (e.g., activated carbon) are more commonly used for treatment of groundwater polluted with organic chemicals.

It is unclear that the information in Table 8 has adequately considered the commonly incurred costs associated with design, testing and optimization of the groundwater extraction and treatment systems. Commonly, groundwater pump and treat system require some level pilot/treatability testing and evaluation before installation of a full-scale system. Other tasks not identified in Table 8 would include regular sampling of treatment system effluents, analytical costs, and operation & maintenance costs associated with the extraction and treatment system.

The overall cost estimates for corrective actions required to mitigate a reasonably foreseeable release to groundwater appear to be very low. Based upon the past experience of the Regional Board, groundwater extraction and treatment systems for a landfill facility may range in costs between $1,500,000 to over $6,000,000. The estimated costs for mitigation of a foreseeable release must be revised in the next version of the JTD. The RWQCB considers the financial assurance information presented in the JTD to be incomplete at this time.

If you have any questions regarding this letter, please contact Ms.Carol Tamaki at (858) 467 – 2982 or *via* e-mail at **tamac@rb9.swrcb.ca.gov**.

Sincerely,

- - Original signed by - -

JOHN R. ODERMATT, Senior Engineering Geologist
Land Discharge Unit
JRO:cat:clc land_disposal_unit\carol\gregory_canyon\final.comm.JTD.Feb2001_gregjtd4ltr.doc

Cc: Ms. Michele Stress, Local Enforcement Agency, Department of Environmental Health, County of San Diego, 9325 Hazard Way, San Diego, CA 92123

Mr. Michael Wochnick, Remediation and Closure Technical Services, California Integrated Waste Management Board, P.O. Box 4025, Sacramento, CA 95812-4025